Threats Assessment for Puget Sound &
Current and Proposed Actions to Address Those Threats

There are a variety of human activities that create threats to Puget Sound, at different scales and in different manners. The current harm, and potential magnitude of future harm, from these threats is a function of both the scope and extent of the activity and the effectiveness of any controls applied to that activity.

To select the leading threats, profiled below, we reviewed various sources of stress to the system, the trends in those sources, the level of risk posed by each source (its ability to cause harm coupled with its scale), and our current ability to address it. That assessment is a work in progress and we propose to further refine the analysis with a broader group of scientists in the coming months. A summary on four of the top threats follows.

STORMWATER RUNOFF

Stormwater runoff presents a high risk to the health of Puget Sound because it affects virtually all the basin and because of the high volume of runoff and contaminants that it delivers to the Sound. Population growth and development patterns in the Puget Sound region have significantly decreased the amount of forest cover in the basin, while increasing the amount of impervious surface, which has increased the volume and toxicity of runoff into the Sound.

Stormwater runoff can include a mixture of oils and heavy metals from vehicles and industrial processes; fertilizers, pesticides and herbicides from homes and farms; pet and animal wastes; sediment from construction sites; and pollutants that settle out of the air onto the land, such as polycyclic aromatic hydrocarbons (PAHs). This mixture is carried—untreated in most of the basin—into Puget Sound.

Stormwater runoff causes two major problems. Runoff moves pollutants from all impervious surfaces (roads, rooftops, lawns, etc.), and transports them into streams, rivers and marine waters, and runoff can greatly increase natural flows, which can overwhelm stream channels, undercut and erode stream banks, deposit excessive sediment, and alter fish and wildlife habitat.

The risk to the Sound from stormwater is magnified by the fact that population growth will continue in the region, and that neither our current infrastructure nor our current methods to develop land and manage stormwater runoff deal effectively with the problems.

Actions Underway to Address Stormwater Runoff in the 2005-2007 Biennium

1. 76 new communities in the Puget Sound basin will come under National Pollutant Discharge Elimination System (NPDES) stormwater permits to improve control and reduce the discharge of pollutants into the Sound.
2. Industries will improve management of runoff from their properties according to an updated NPDES permit, and Department of Ecology staff will carry out inspections at 600 industries.
3. Construction site operators improve management of runoff according to an updated NPDES permit, and Ecology staff will carry out inspections at 500 construction sites.
4. At least 11 local jurisdictions will revise their development regulations to facilitate innovative stormwater techniques known as low impact development (LID) to reduce stormwater runoff.

5. Washington State Department of Transportation (WSDOT) will improve the management of runoff from state highways by using an updated manual of practices on all new highway projects and upgrades, by better management of highway construction sites, and by completing one stormwater retrofit project.
6. The number and volume of combined sewer overflows (CSOs) into Puget Sound will continue to decrease, with 80 percent of local jurisdictions with CSOs meeting the milestones of their approved plans.

New Actions on Stormwater Proposed in the Governor's Supplemental Budget

Local Innovative Stormwater Project Grants **$2,500,000**

Grants to local governments for innovative stormwater projects (natural drainage systems, green roofs, permeable pavement, rain gardens).

CONTAMINATION FROM TOXICS

In the past 100 years, human activities around Puget Sound have introduced a wide array of chemicals into the environment that are poisonous and cause health problems for humans, plants and animals. The more persistent chemicals have accumulated in the sediments of the Sound (there are 101 active Superfund sites in Puget Sound, aquatic and terrestrial), and from there have accumulated in the tissues of living organisms throughout the food web. Many types of fish as well as seals and orca now show high levels of toxic contamination. Periodic consumption advisories on fish and shellfish from the Sound are becoming more common.

The toxic discharges continue. In 2001, more than 879,000 pounds of toxic chemicals were released into the water from industrial point sources. We do not have corresponding figures from the approximately 50 sewage treatment plants that discharge roughly 600 million gallons per day of treated wastewater. Another 7.7 million pounds of toxic chemicals were released into the air in the Puget Sound basin from stationary sources (not including any mobile sources such as cars or trucks). The magnitude and extent of ongoing toxic release into the basin is a significant threat to the system's long-term health.

As our population increases, the flow of chemicals from households and businesses into our municipal sewage treatment plants is projected to increase. Toxic compounds that are not completely removed by conventional treatment plants will reach the environment in greater quantities. In addition to pathogens and nutrients, these releases increasingly contain new contaminants of concern, broadly referred to as pharmaceuticals and personal care products. These include a potpourri of largely unstudied chemicals contained in such products as Prozac and Vioxx, Viagra, fragrances, creams, detergents and cleaners. These chemicals pass though us and our households into and through sewage treatment plants, and ultimately into the water.

Actions Underway to Control Toxics in the 2005-2007 Biennium

1. State and federal agencies continue to identify and clean up contaminated upland and aquatic sites. Approximately 7 percent of known sites are cleaned up annually.
2. By the end of the biennium, 85 percent of the municipal and industrial wastewater permits in the basin will be renewed or newly issued within the past five years, providing an opportunity to reduce toxic loadings from approximately 100 facilities.

3. Ecology is completing the Persistent Bioaccumulative Toxics (PBT) rule, which will establish a process whereby PBTs are identified and chemical action plans are developed for specific toxins. The mercury action plan is being implemented, a plan to control flame retardants will be completed and implemented, and an action planning for one more chemical will begin.
4. Local and state programs are helping reduce diesel tailpipe emissions from a variety of sources, particularly marine vessels and nearshore equipment such as trucks at ports and train engines.
5. Systems to prevent and clean up oil spills are being further improved with assistance from a new advisory committee.
6. The world's largest membrane bioreactor sewage treatment plan is nearing completion at King County's Brightwater plant, pioneering a new approach to removing dangerous compounds from wastewater.

New Actions on Toxics Proposed in the Governor's Supplemental Budget

Oil transfer inspection (SB 6641) **$859,000**

Senate Bill 6641, passed in 2004, requires companies to place containment boom around vessels and have spill prevention measures in place when delivering fuel and other petroleum products to vessels in Puget Sound, except in the case of highly flammable products as determined by Ecology. To implement this legislation, Ecology needs funding for a state oil transfer inspection program.

Hazardous material spill response **$301,000**

With a 30-percent increase in the number of hazardous materials spills over the past three years, including an increase of more than 300 reports a year in the state's northwest counties. This action adds spill responders for pipeline, oil refining and transportation-related spills.

Statewide equipment caching for early spill response **$725,000**

Spill response equipment (booms, absorbent material, etc.) will be strategically placed at 40 critical locations around Puget Sound where currently, in many cases, equipment is hours away in the event of a spill.

Cleanup state-owned aquatic lands **$5,785,000**

This program, led by Ecology and coordinated with the Department of Natural Resources, will target contaminated aquatic sites where early cleanup and source control actions will allow for restoration of state resources, including geoduck, other shellfish and/or habitat features.

Increase the rate of cleanup at contaminated sites that impact Puget Sound **$5,000,000**

Ecology will accelerate the cleanup of contaminated sites that lie adjacent to and are within one-half mile of Puget Sound. This action will include a combination of strategies that uses the Voluntary Cleanup Program, existing formal administrative oversight capabilities, and contracted cleanups for orphan and abandoned sites that pose a threat to Puget Sound.

Reduce toxics in businesses (technical assistance) **$458,000**

Additional staff to increase Ecology's technical assistance, incentives and funding to help Puget Sound industrial and commercial facilities eliminate or reduce the production of wastes that contain toxic contaminants and make other water and energy saving improvements.

Remedial action grants (Bellingham Bay) **$7,500,000**

Clean-up of 11 contaminated properties in Bellingham Bay or near the shore, including the 137-acre Georgia-Pacific Mill property.

Remedial action grants (Port of Tacoma) **$3,400,000**

Cap contaminated sediments under Pier 25 as part of the Mouth of Hylebos Cleanup Project within the Environmental Protection Agency's overall Commencement Bay cleanup.

HABITAT LOSS

Extensive development and land conversion throughout the Puget Sound basin in the last hundred years has driven significant loss of fish and wildlife habitat, on the shorelines, near rivers and streams that empty into the Sound and in the uplands. Habitat has also been impaired through the introduction of non-native and invasive species, which can alter habitats and overwhelm native species. Derelict fishing gear (ghost nets, abandoned crab pots, etc.) has also detracted from the health of the Sound's habitats.

This loss and alteration of key habitat has led to a resulting pressure on many of the Sound's living resources, from saltmarshes, eel grass beds and forage fish and rippling up the food web to salmon, marine birds and orca whales.

Habitat loss and impairment is a continuing threat to the health of the Sound as the region gears up for an additional 1.4 million residents with some of that growth encroaching into previously undisturbed areas. The problem of habitat loss is also critically linked to the stormwater runoff problems described above.

Actions Underway to Preserve Habitat in the 2005-2007 Biennium

1. Local governments are updating their local shoreline master plans and their critical areas ordinances. These are key actions that hold important potential to protect critical habitats and regulate shoreline development. State agencies are working with local governments, providing technical assistance and advice on proposed ordinances.
2. Federal, state, and local agencies work with landowners to educate them on voluntary, non-regulatory actions that can be taken to provide habitat protection.
3. Approximately 60 nearshore habitat acquisition, restoration and assessment actions are planned for the next round of SRF Board grants.
4. Through a variety of programs, approximately 2500 acres of nearshore, estuarine and freshwater habitats will be permanently protected over the biennium.
5. State and federal agencies are coordinating on an aggressive program of spartina removal, and improving invasive species programs to prevent the introduction of new species.

New Actions on Habitat Proposed in the Governor's Supplemental Budget

Nearshore Ecosystem Restoration **$1,250,000**

Enhanced funding for the Puget Sound Nearshore Partnership (PSNP), which includes the U.S. Army Corps of Engineers, state and federal agencies, Indian tribes, industries and environmental organizations. PSNP targets some of the foremost habitat restoration needs in Puget Sound, specifically to identify significant ecosystem problems, evaluate potential solutions, and restore and preserve critical nearshore habitat.

Clean up Creosote Logs **$2,000,000**

Removal of derelict structures, particularly creosote pilings, by the Department of Natural Resources.

Restore Estuaries and Salmon Habitat **$2,500,000**

Targets $20 million in high-priority estuary and salmon restoration projects in the Snohomish, Stillaguamish, Skagit, Dungeness and Nisqually.

ONSITE SEWAGE SYSTEMS

Individual onsite sewage (septic) systems have proliferated around Puget Sound and remain the most common method of sewage treatment for new development outside urban areas. There are nearly half a million onsite sewage systems in the basin. These systems, when properly designed, located and maintained, discharge only small amounts of pathogenic pollutants. However, numerous older systems throughout the Sound are failing and/or are poorly designed or located, and these systems can discharge not only biological hazards, but also oxygen-demanding substances and other chemicals of concern.

Onsite septics do not generally rise to the same level of risk on a sound-wide scale as the previous three threats addresse; however, in some cases septic systems do pose significant risks. Hood Canal, for example, has been particularly hard hit by failing and outdated onsite systems. A recent study found that as much as 60 percent of the nitrogen released to the Canal from human activities comes from onsite systems. And to make matters more complicated, even well functioning and well-maintained conventional onsite systems do little to reduce nitrogen concentrations in the effluent.

In many other areas shellfish harvest has been restricted by bacterial pollution from poorly functioning systems.

Onsite systems pose a continuing threat to the health of the Sound because without regular maintenance, over time they will fail and discharge increasing quantities of biological and chemical pollution into the marine waters of the state.

Actions Underway to Improve Onsites Management in the 2005-2007 Biennium:

1. The Department of Health is working with local health jurisdictions carry out the recently updated state rules for county onsite regulations, including development of new onsite sewage system management plans in each of the 12 local health jurisdictions.
2. Puget Sound Action Team and state agency staff continue to work closely with staff from counties bordering Hood Canal to develop strategies to address onsite systems in the Canal area and to pilot new technologies that remove nitrogen from septics effluent.

New Actions on Septics Proposed in the Governor's Supplemental Budget

Helping homeowners save the Sound (septic systems) **$5,000,000**

New program to provide low- and no-interest loans to home- and landowners to repair and replace septic systems. Would expand in future to include low impact development.

Hood Canal and Puget Sound wastewater projects at state parks **$4,000,000**

- Replace leaking wastewater collection and treatment system at Twanoh State Park to meet Department of Health (DOH) and county standards.
- Replace 30-year-old wastewater system at Dosewallips State Park to meet (DOH) and county standards.
- Install new parkwide wastewater system at Larrabee Park, where current system discharges raw sewage directly into Puget Sound.
- Install new parkwide wastewater system at Fort Casey State Park, where current system has been repeatedly failing.
- Replace recreational vehicle dump station that has been shut down for three years, due to drain field failure, at Kitsap Memorial Staet Park.
- Install new parkwide wastewater system at Fort Ebey State Park, whose current system is undersized for current park use and is failing.
- Replace 30-year-old sewer lift station at Birch Bay State Park that is operating inconsistently and is within feet of salmon-spawning areas in Puget Sound and Terral Creek.
- Connect Sequim Bay Park to the City of Sequim sewage treatment system. Currently, the park's outdated lagoon wastewater collection and treatment system discharges to an above-ground spray field.